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Editorial

Plasmonics and Nanophotonics

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Nanostructures have attracted considerable attention for many new fantastic applications owing to their remarkable physical properties. Most recent work has demonstrated that various material properties can be modified when the materials scale down to nanometers. Interacting with electromagnetic waves, nanomaterials show exciting and interesting phenomena such as subwavelength waveguiding and modulation, light tripping and filtering, and ultraresolution imaging. Although complete control of nanomaterial fabrication remains a challenge, various advanced techniques have been proposed to achieve sub-10 nm patterning. On this basis, desired radiation can be realized by manipulating the nanostructures. These nanostructures, especially the plasmonic nanostructures supporting surface plasmon polaritons, show great potentials in many application fields. For these reasons, this research field, especially plasmonics and nanophotonics, has been experiencing an explosive growth.

In this special issue, we have a series of contributed papers that are focusing on the recent development of the fundamental physics, fabrication, devices, and applications in the field of plasmonics and nanophotonics. First, T. Zhang and F. Shan reviewed the development and application of surface plasmon polaritons on optical amplification. Y. Yu et al. performed a literature survey on the recent advances in theory and applications of transmissive/reflective structural color filters. Then some of the research papers illustrated the research on the synthesis and application of nanostructures: Q. Xiliang et al. reported a successful large-scale synthesis of silver nanoparticles by aqueous reduction for low-temperature sintering bonding; Y.-J. Song et al. demonstrated that silver nanowires can be applied to transparent conducting film and electrode of electrochemical capacitor; J. Huang et al. studied the Si_3N_4-SiCp composites reinforced by in situ cocatalyzed generated Si_3N_4 nanofibers. In the meantime, some of the papers covered the optical waveguide and its functional device: P. Zhao et al. studied the $BaYF_5$: 20% Yb^{3+}, 2% Er^{3+} nanocrystals doped SU-8 polymer waveguide and spotlighted its optical amplification at 1525 nm; X. Sun et al. demonstrated a variable optical attenuator based on long-range surface plasmon polariton multimode interference coupler. Finally, P. M. Vara et al. investigated the partial polarization in interfered plasmon fields.

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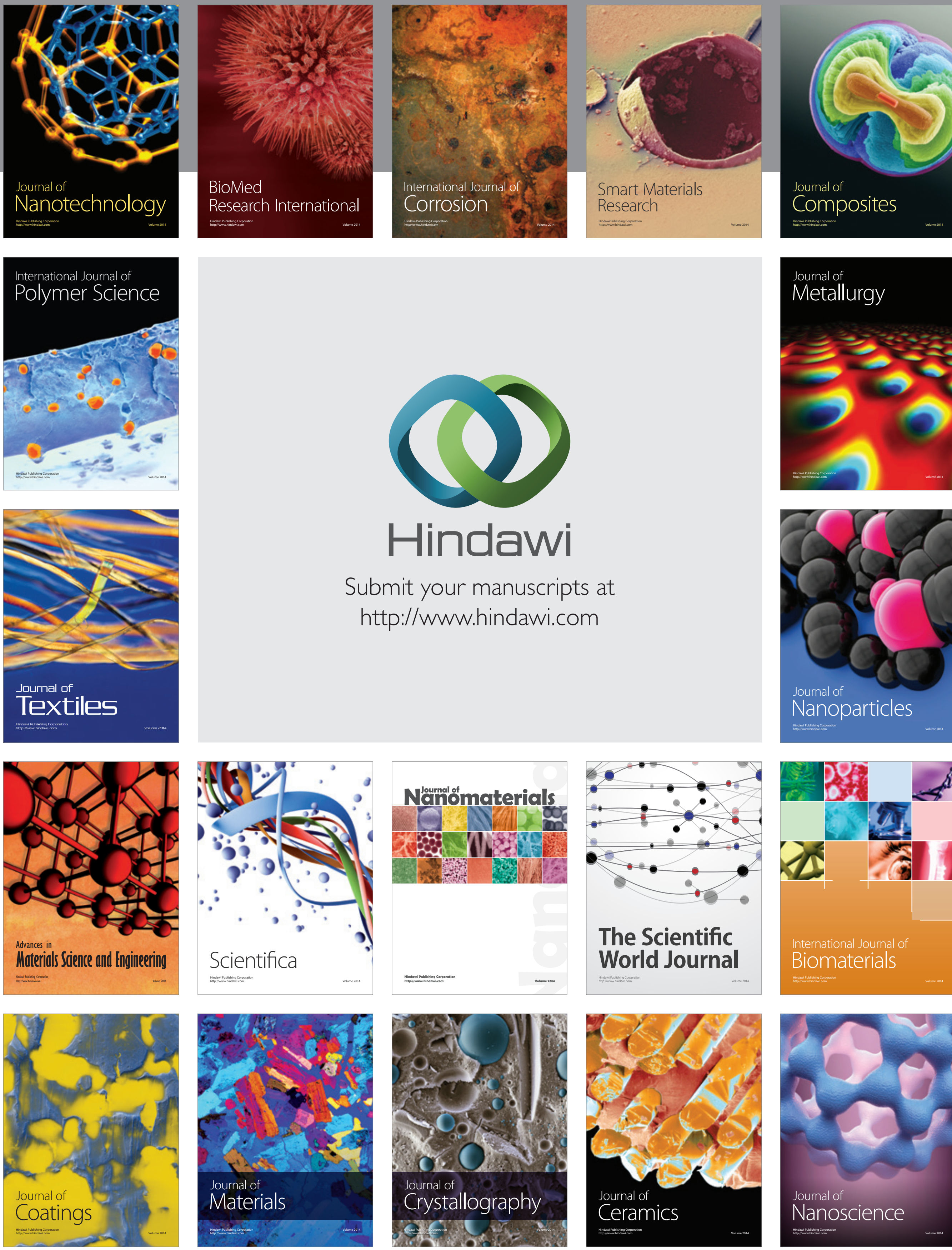
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